

THIRTY-FIRST ANNUAL REPORT
OF THE
NATIONAL ADVISORY COMMITTEE
FOR AERONAUTICS

1945

INCLUDING TECHNICAL REPORTS
NOS. 804 to 833



STABILITY RESEARCH DIVISION

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THIRTY-FIRST ANNUAL REPORT

OF THE

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

FOR 1945

WASHINGTON, D. C., *June 15, 1949.*

The Thirty-first Annual Report of the National Advisory Committee for Aeronautics covers the fiscal year 1945, and includes Technical Reports Nos. 804 to 833. Because of wartime security requirements, the Committee did not then prepare a formal report of its activities during the fiscal year 1945, and the technical reports of that year published in this volume were also withheld from general distribution at that time.

A summary of important research activities of the Committee during the war years was presented in the Thirty-second Annual Report of the Committee for the fiscal year 1946, published in 1947.

The National Advisory Committee for Aeronautics was established by act of Congress, approved March 3, 1915 (U. S. C. title 50, sec. 151), to "supervise and direct the scientific study of the problems of flight with a view to their practical solution" and "direct and conduct research and experiment in aeronautics" in such laboratories as may be placed under its direction. In 1945, the Committee had three major research stations: The Langley Memorial Aeronautical Laboratory, at Langley Field, Va.; the Ames Aeronautical Laboratory, at Moffett Field, Calif.; and the Aircraft Engine Research Laboratory, at Cleveland, Ohio.

In 1945 the decisive effect of superior air power in coordinated military operations was established. Sustained air attacks on German centers of production, particularly oil refineries and aircraft factories, were a major factor in rendering the German war machine virtually immobile and in hastening German capitulation. Allied aircraft in superior numbers and of superior quality had pinned what was left of the Luftwaffe to the ground, and roamed Germany almost at will in vital support of rapidly-moving Allied ground forces.

Air supremacy was also a major factor in bringing about the unconditional surrender of Japan.

These achievements were the product of total war effort, an important part of which was contributed by America's research laboratories. The major effort of the NACA was devoted to the task of increasing the effectiveness of America's combat aircraft. At the same time, the NACA was deeply engaged in research leading to the development of new types of aircraft and equipment. The increased speed capabilities of war-developed aircraft and the new impetus given to the possibility of supersonic flight by jet propulsion, posed new aerodynamic and structural problems that not only required remedial research as they were encountered, but defined a vast new field of research requiring intensive exploration. Extension of transonic and supersonic research facilities became a matter of high priority. Two small supersonic wind tunnels were completed at the Committee's propulsion research laboratory at Cleveland in June of 1945 and plans for further needed construction were advanced.

During the year, the following changes were made in the membership of the main Committee:

On August 17, 1944, Vice Adm. Aubrey W. Fitch, U. S. N., succeeded Rear Adm. John S. McCain, U. S. N., who was relieved for other duty.

On October 11, 1944, Rear Adm. Lawrence B. Richardson, U. S. N. succeeded Rear Adm. E. M. Pace, U. S. N., who retired from the service.

On January 20, 1945, Dr. Alexander Wetmore succeeded Dr. Charles G. Abbot on the Committee as Secretary of the Smithsonian Institution.

On June 11, 1945, Maj. Gen. Edward M. Powers, U. S. A. succeeded Maj. Gen. Oliver P. Echols, U. S. A., who retired from the service.

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The main Committee is assisted by a number of technical committees and subcommittees which recommend research programs in the various specialized fields. These committees are composed of representatives of Government agencies and individuals from industry and educational institutions, who are chosen on the basis of their personal knowledge of the special fields and who serve as committee members without pay. The members are selected with a view to assisting the main Committee with well informed advice in all the specialized fields of research.

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EXPANSION OF FACILITIES

During the fiscal year, the following research facilities were completed and placed in operation:

AIRCRAFT ENGINE RESEARCH LABORATORY,
 CLEVELAND, OHIO

In August 1944, the Jet Propulsion Static Test Laboratory was completed. Compressor and turbine research facilities in the Engine Research Building were completed in November of 1944. In June 1945 two supersonic tunnels were completed, the 18- by 18-inch and the 20-inch circular.

LANGLEY MEMORIAL AERONAUTICAL LABORATORY,
 LANGLEY FIELD, VA.

In April 1945, the Physical Research Laboratory was completed, providing special facilities for investigation of basic problems in physics that arise in many NACA research projects.

A pilotless aircraft research station was begun in the spring of 1945 at Wallops Island, Va. The first missile was fired in June of 1945.

FINANCIAL REPORT

Appropriations for the fiscal year 1945.—Funds in the following amounts were appropriated for the Committee for the fiscal

year 1945 in the Independent Offices Appropriation Act, 1945, approved June 27, 1944; the First Supplemental Appropriation Act, 1945, approved December 22, 1944; and the First Deficiency Appropriation Act, 1945, approved April 25, 1945:

Salaries and expenses.....	\$26, 542, 330
Printing and binding.....	15, 000
Construction and equipment of laboratory facilities:	
Langley Memorial Aeronautical Laboratory..	4, 935, 000
Aircraft Engine Research Laboratory.....	9, 450, 000
Total appropriations.....	40, 942, 330

Obligations incurred during the fiscal year 1945 are listed below. The figures shown are total obligations and include the cost of personal services, travel, transportation, communication, utility services, contractual services, supplies, and equipment.

Salaries and expenses:	
Headquarters Office, Washington, D. C.....	\$407, 806
Langley Memorial Aeronautical Laboratory...	10, 832, 226
Ames Aeronautical Laboratory.....	3, 050, 071
Aircraft Engine Research Laboratory.....	10, 455, 750
Research contracts—educational institutions..	443, 587
Transfer to Bureau of Standards.....	145, 300
Printing and binding, all activities.....	13, 776
Construction and equipment of laboratory facilities: ¹	
Langley Memorial Aeronautical Laboratory...	881, 222
Aircraft Engine Research Laboratory.....	3, 895, 902
Total obligations.....	30, 125, 640
Unobligated balances:	
Salaries and expenses ²	1, 207, 590
Printing and binding.....	1, 224
Construction and equipment ³	9, 607, 876
Total appropriations.....	40, 942, 330

¹ Includes obligations incurred against prior year appropriations available for obligation in fiscal year 1945.

² Includes budgetary reserve of \$1,128,000.

³ Remains available for obligation in future fiscal years.